

# **Third party access to cable modems in Canada**

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For the FCC Notice of Inquiry on Open Access to the Internet  
GN Docket No. 00–185

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## Introduction

In Canada, the Canadian Radio and Television Commission<sup>1</sup>, the CRTC, is the governmental agency equivalent to the FCC in the USA. In this article, we discuss the history of the CRTC decisions to allow resale at a discount and third party access of cable modems by Internet service providers in Canada.

In its Decision 99–11<sup>2</sup>, issued on September 14<sup>th</sup> 1999, the CRTC ordered that cable television carriers make their cable modem Internet access services available for resale by ISPs at a 25% discount from their lowest retail rates, until such time as the commission approves interconnection rates. On August 21<sup>st</sup> 2000, in Order 2000–789<sup>3</sup>, the CRTC has approved the terms and rates of cable carriers higher–speed access services with respect to the monthly per end–user access rates. In the same decision, the CRTC has indicated that further to industry consensus occurring in the CRTC Industry Steering Committee, it would proceed with establishing further process to approve of interconnection charges.

In this article, we attempt to provide the reader with the facts that have led to the current situation as of December 1<sup>st</sup> 2000.

The Canadian cable television operators have been regulated under the Canadian Telecommunications Act since January 1996<sup>4</sup>, in those instances where their systems have been used to provide telecommunications services. Despite being ordered to provide third party access to their facilities, the Canadian cable television carriers continued to expand their market share by foot–dragging in the implementation of third party access mandated by CRTC Decisions 98–9<sup>5</sup> and 99–8<sup>6</sup>. Despite being ordered to provide resale at a 25% discount for over 14 months, some cable carriers are using long–term contracts to defeat the purpose of Decision 99–11<sup>7</sup>.

No ISPs have yet been able to compete on price against cable television carriers in the marketplace today. Even Decision 99–11, which mandated resale at a 25% discount has yet to produce any result and is set to become obsolete the day, without any mandated transition period, third party access becomes available.

We find that all decisions made to date are inadequate from the perspective that ISPs are condemned to accept today's Internet access service definitions provided by the incumbent carriers. As with end–users of services of cable carrier, ISP end–users are being subjected to the same service restrictions and usage–sensitive pricing without being given any chance to differentiate their services from the one offered by cable carriers.

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<sup>1</sup> <http://www.crtc.gc.ca>

<sup>2</sup> <http://www.crtc.gc.ca/archive/Decisions/1999/DT99–11.htm>

<sup>3</sup> <http://www.crtc.gc.ca/archive/Orders/2000/O2000–789.htm>

<sup>4</sup> <http://www.crtc.gc.ca/archive/Decisions/1996/DT96–1.htm>

<sup>5</sup> <http://www.crtc.gc.ca/archive/Decisions/1998/DT98–9.htm>

<sup>6</sup> <http://www.crtc.gc.ca/archive/Decisions/1999/DT99–8.htm>

<sup>7</sup> <http://www.crtc.gc.ca/PartVII/Eng/8646/C51–01.htm>

## **The Regulatory situation in the USA versus Canada**

Canadian cable television operators have been regulated since January 1996 as common carriers when providing Internet Access Services. This fact seems to be the principal reason there is a policy difference between Canada and the United States as regards third party access to cable.

The Canadian approach to regulate cable television operators as common carriers seems to have been taken from a relatively pure application of the law. In Telecom Decision CRTC 96-1 of January 31, 1996,<sup>8</sup> the Commission first determined that the services in question were not "programming" within the meaning of the Broadcasting Act. Then the Commission determined that, since "broadcasting" is a special case of "telecommunications" in Canadian law, the next issues to be determined were a) whether a person that carries on a distribution undertaking under the Broadcasting Act is a "telecommunications common carrier" pursuant to the Telecommunications Act when it provides non-programming services using the same distribution network, and b) the second issue, of whether the telecommunications common carrier is subject to the legislative authority of Parliament. The whole of the CRTC decision reads as a straightforward application of legal reasoning from the statutes in question.

The same issue has not been resolved in the United States. The FCC's brief in the Portland cable access ruling<sup>9</sup> of August 16, 1999, the Commission's lawyers wrote:

"To date, the Commission has not declared whether broadband capability offered over cable facilities is a "cable service" under the Communications Act, or instead should be classified as "telecommunications" or as an information service".

and later:

"For the foregoing reasons, the Court should recognize that there is an unresolved controversy concerning the proper characterisation of cable modem service, keep in mind the possibility of agency pre-emption..., and resolve the dispute in a narrow fashion".

The Internet, in Canada, has never been given the chance to evolve into a regulatory gray-zone, as it has evidently happened in the USA. This is largely because the CRTC decision to regulate cable television operators as common carriers in Canada occurred before the phase of mass commercialization of the Internet. In contrast, the US Cable Television cable television operators, fearing common carrier obligations, are now steadily invoking the argument that it is not in the public interest to regulate the Internet, in order to avoid being regulated as common carriers.

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<sup>8</sup> <http://www.crtc.gc.ca>

<sup>9</sup> Various available at <http://www.natoa.org> and on the Cybertelecom mailing list at <mailto://cybertelecom-l@listserv.aol.com>

## **Regulatory status of Canadian cable television carriers with respect to Internet access services**

Even though Canadian cable television operators have been declared to be common carriers since January 1996, the cable television carriers have since consistently demonstrated their mastery of the art of evading regulation. By showing a pretty face in appearing to fully collaborate with the CRTC, they have been able to delay third party access without any reprimand. At a time when some smaller players have already begun selling services to ISPs, such as Regional Cablesystems in Sudbury, Ontario, none of the big players have yet to make their services available for resale by third parties.

### **Timeline Summary**

May 17 <sup>th</sup> 1999	CAIP Part VII Application	CAIP Requests immediate relief and demands that the Resale of services be made available immediately.
July 6 <sup>th</sup> 1999	CRTC Decision 99–8	CRTC requires that the rates for third party access be filed by September 6 <sup>th</sup> 1999.
September 6 <sup>th</sup> 1999		Cable television carriers file substantially incomplete comments to Decision 99–8 accompanied with a request for an extension until November 8 <sup>th</sup> 1999.
September 14 <sup>th</sup> 1999	CRTC Decision 99–11	CRTC answers to the Part VII Application of CAIP filed on May 17 <sup>th</sup> 1999 by mandating resale of cable modem services at a 25% discount to the lowest resale rates, to ISPs.
September 21 <sup>st</sup> 1999	Letter from the CRTC addressed to the CCTA and Videotron.	CRTC grants the requested extension to November 8 <sup>th</sup> 1999 made by the cable television carriers. Reminds CCTA and Videotron that the third party access rates to be filed are not to be limited to residential services.
November 8 <sup>th</sup> 1999	New deadline for cable television carriers to file third party access (TPA) rates as set forth by CRTC Decision 99–8.	Cable television carriers are expected to file finished rates. Several new points previously left unanswered in the CCTA–CAIP negotiations are expected to be raised, including a number of restrictions directed only at interconnecting ISPs.

November 18 <sup>th</sup> 1999	Deadline for interested parties to provide comments on the proposals for the TPA rates filed by the cable television carriers.	<p>ISPs are expected to provide their comments on the failure of these proposed third party access rates to meet their objective of a profit margin greater than the one of resale (&gt;25%).</p> <p>ISPs are also expected to challenge the attempts of cable television carriers to vertically control the interconnections by disputing the legitimacy of the TPA service restrictions.</p>
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December 15 <sup>th</sup> 1999	Availability of resale, at a 25% discount from the lowest market prices, by ISPs, in compliance with CRTC Decision 99–11.	<p>Cable television carriers have no choice but to comply with Decision 99–11. It remains to be seen whether or not the cable television carriers will comply by this date.</p> <p>Will Canadian ISPs take the risk of advertising that you will be able to get cable modem services from them as your 1999 Christmas Gift?</p>
June 2000	<p>Availability of cable modem services from ISPs through interconnections facilitated by third party access rates.</p> <p>The cable television carriers have repeatedly committed to this time frame. Changing it would potentially cause them a lot of damage.</p> <p>Videotron has scheduled the industry trial for TPA being conducted between UUNET and Videotron in Montreal, to be completed by June 2000.</p>	<p>The availability of TPA by June 2000 guarantees almost 6 months of resale activities in the Canadian marketplace.</p> <p>Until this date is reached, the ISPs can pretty much advertise their services as being the same thing, but at a good discount. (i.e. Buy cable modem services from an ISP and get at least the same thing or even better, at 10% less).</p> <p>What remains to be found is if, by the time TPA is available, ISPs will be able to compete with the bundling of Internet Access and Voice over IP–based Residential Telephony services of the incumbents cable television carriers.</p>
August 21 <sup>st</sup> 2000	CRTC Order 2000–789	Approves third–party access per–end–user monthly rates
Pending	Re. CRTC Order 2000–789	Winback guidelines
Pending	Re. CRTC Order 2000–789	Consensus being established in CRTC CISC HSWG
Pending	Re. CRTC Order 2000–789	Approval of outstanding rating issues of Order 2000–789 related to Point Of Interconnection so that cable carriers can start offering third party access
Pending	Re. CRTC Order 2000–788	Videotron forced to provide resale at 22.46\$ per month until such time as third–party access

Pending	Re. Part VII on ADSL rates	CAIP Part VII on Bell Canada ADSL rates will force synchronization of third party access to cable carriers higher-speed access services and similar services provided by incumbent local exchange carriers.
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### **The state of cable television telecommunications infrastructure in Canada**

Cable television distribution facilities are generally newer in Canada than in the United States and the overall penetration rate is higher in Canada than in the United States, both in terms of subscription rates and homes passed (homes to which the service is available). Because of these important facts, Internet Access over cable television facilities has been widely marketed in Canada since 1995. In the province of Quebec, the two largest incumbent cable television carriers have already announced the entire bi-directionalization of their hybrid fiber coaxial backbones. Finally, in Canada, cable television networks have never been subject to municipal licences, but have always been subject to federal regulation under the Broadcasting Act.

In Decision 98–9, the CRTC found both that the Canadian cable television carriers had substantial market power and that the market for high-speed Internet access services was not sufficiently competitive for the commission to forbear from regulating. The finding by the commission that the Canadian cable television carriers had substantial market power with respect to the provisioning of higher-speed Internet access services is good testimony to the advanced state of this telecommunications infrastructure in Canada.

### **Meeting the obligations of being a cable television carrier in Canada**

Decision 96–1 was not strong enough to ensure that cable television carriers would begin to meet their common carrier obligations. By way of Decision 98–9 and Decision 99–8, the CRTC tried to politely enforce the common carrier obligations of cable television operators. Since then, Canadian cable television carriers have continued to expand their market at the expense of ISPs by delaying the implementation of the earlier CRTC orders.

To this date, intervention by the Canadian Federal Government has yet to result in ISPs being afforded the chance to compete effectively. Canadian cable television carriers still offer their services as a monopoly. Although Decision 99–11 finally brings some desperately needed relief, the mere ability to resell the services of the cable television carriers is not enough. To approve only resale of services, as defined by the cable carriers, is to prevent the ISPs from competing with the cable carriers by providing superior services over the cable television infrastructure.

ISPs are now aware of the services they will need to provide in the long run, if they are to fully compete with everything that cable television carriers are indeed capable of offering. However, today, the Internet access services of the cable television carriers are designed in such a way that Internet telephony and Internet television would not work very well.

In Decision 99–11, the CRTC clearly stated that the implementation of the decision to force resale of cable modem services would not be permitted to further delay the current schedule for the implementation of the July 1998, Decision 98–9.

The CRTC is responsible for ensuring a smooth transition from a requirement for resale to a third party access environment. In order to do this, the CRTC must clearly understand all implications of regulating by way of mandating TCP/IP interconnections between the facilities of the ISPs and of the cable television carriers.

### **Resale Versus Third Party Access**

As explained earlier, in Decision 99–11, the CRTC decided to mandate the resale of cable modem services. This decision went against the original intention of the CRTC not to mandate resale, as stated in Decision 98–9 of July 9th 1998. The reason why resale has been mandated was purely the result of the CAIP complaint of May 17th 1999.

The CRTC will probably never admit it in public that mandating resale was probably the only way to get the ball rolling again after the extremely poor responses of the Canadian cable television carriers to both Decisions 98–9 and 99–8.

No cable television carrier is expected to welcome competition from parties to which it is obligated to resell services at a 25% discount below lowest retail rates. The 25% figure is very important as 1) it denies the possibility that discount-based bundling of services be used at a disadvantage to ISPs and 2) it also forces cable television carriers to develop third party access rates which guarantee at least a 25% margin for ISPs.

### **Third Party Access**

Discussions conducted between CAIP and Videotron in the summer of 1999 were revealed to the public through a status report filed on August 10th 1999<sup>10</sup>. This report stated that cable television carriers were now going to claim that the Point Of Interconnection (POI) should not be used to introduce any architectural change to their existing networks, but rather as a mere addition required for providing interconnections to third parties. Specifically, Videotron challenged the POI reference architecture<sup>11</sup> of the CCTA, by saying that the POI was an addition to their existing network architecture and that the reference architecture below was not a representation of their network.

Third party access is enabled by a Point Of Interconnection (POI), which provides the interconnection between the ISP network and the cable television carrier network.

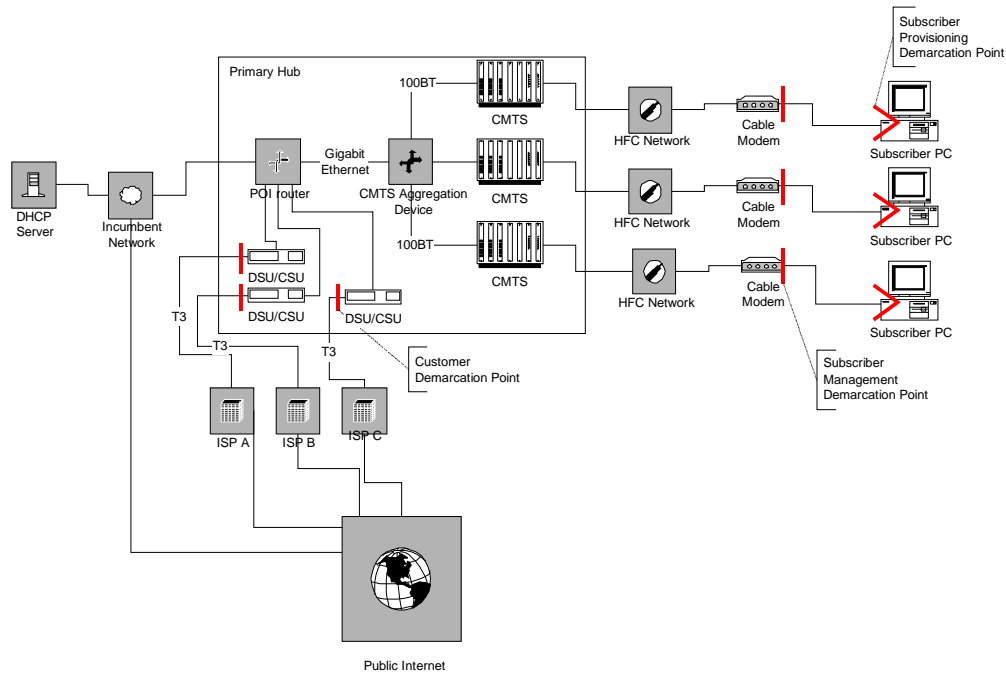
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<sup>10</sup> [http://www.crtc.gc.ca/ENG/PROC\\_REP/TELECOM/1998/8638/CCTA/Tech0810.doc](http://www.crtc.gc.ca/ENG/PROC_REP/TELECOM/1998/8638/CCTA/Tech0810.doc)

<sup>11</sup> [http://www.crtc.gc.ca/ENG/PROC\\_REP/TELECOM/1998/8638/CCTA/tekdec22.doc](http://www.crtc.gc.ca/ENG/PROC_REP/TELECOM/1998/8638/CCTA/tekdec22.doc)



The following diagram depicts the original proposed architectural reference model of interconnection between the Canadian cable television industry and the Canadian ISPs.



<b>TEKTON</b>	TITLE: Equal Access Logical Network Diagram	FILENAME: EA Logical.vsd
	PROJECT: Equal Access – Point of Interconnect	CREATOR: Frank Reiter
	DATE: 12/11/98	TIME: 2:35:21 PM PG: 1 OF 1 PGS
	© 1998 Tekton Internet Associates, Inc	

Diagram courtesy of Tekton Internet Associates Inc. From  
[http://www.crtc.gc.ca/ENG/PROC\\_REP/TELECOM/1998/8638/CCTA/tekdec22.doc](http://www.crtc.gc.ca/ENG/PROC_REP/TELECOM/1998/8638/CCTA/tekdec22.doc)

However, in order for this drawing to represent the present view of Videotron, there would need to be a line between the **CMTS Aggregation Device** box and the **Public Internet** box.

## **Equal access versus Open Access**

The ability of the cable television carrier to interconnect its facilities to the Internet without having its traffic pass through the POI, represents a dramatic departure from the original memorandum of understanding between CAIP and the CCTA on the definition of POI. According to the ISPs, the ability for cable television carriers to bypass the POI causes the traffic of the cable television carriers to be treated preferentially. Furthermore, the fact that the traffic of the incumbent cable television carrier would not be routed through the POI would also result in customers of the incumbent cable television to never be affected by the downtime of the POI.

For these reasons we find that the terminology equal access should be used as it was in the introduction of competition in long-distance and that the term open access should be retired.

## **Third party access rates**

The 25% discount decided in Decision 99–11 has serious implications on projected cost of the POI, which affects directly the third party access rates. The menace of resale and the mandatory 25% discount are two separate facts of Decision 99–11, which are now motivating the cable television carriers to develop more efficient rates and cost-effective POIs. The first motivating element is that the rates will now need to be completed, filed and approved as soon as possible in order to limit the duration of the availability of resale. The second motivating argument is that the cost of the POI must not become a deterrent preventing the margins of third party access to be any lower than the 25% margins granted through mandatory resale.

## **Forwarding IP packets by looking at the source address field**

In the negotiations between CAIP and CCTA, "source routing" was chosen as the preferred way to split the traffic amongst multiple ISPs peering at a Point Of Interconnection (POI). The choice of the Canadian cable television carriers to use a Cisco TCP/IP router to perform this task was not an element of the negotiations. Neither CAIP nor CCTA found it a problem to limit the choice of the equipment for the POI to only one vendor, i.e. Cisco Systems Inc.

Splitting traffic using "Source Routing" means that the POI equipment is responsible for forwarding the traffic to ISPs by looking at the source field inside each IP packet. When the source IP address is matched as being assigned to a given ISP, the POI device forwards the packet onto the interface that provides the dedicated interconnection to a specific ISP.

The CCTA has proposed that no routing information be exchanged through the POI. The use of a full-blown TCP/IP router to perform source routing would thus be overly expensive. Finally, a device specialized in complex routing algorithms (OSPF, BGP–4) is an overly complex instrument for the only purpose of source routing.

Most Layer 3 Ethernet switches are capable of wire-speed source-address packet forwarding on all of their Ethernet ports. Such equipment has thus supplanted conventional TCP/IP routers as a more appropriate choice for the equipment of the POI. Historically, TCP/IP routers have been designed in such a way that their efficiency was attained by computing fast paths by finding similarities in the destination fields of each IP packets flowing through their interfaces. Forwarding packets by looking at the source field inside each IP packet has always been a challenging task for old process-switched software routers.

The architecture of Layer 3 Ethernet switches is better suited for this task, as they are usually designed using a hardware-based layer 3 switching which is aware of the content of IP packets. Layer 3 switches are capable to perform this task for each and every IP packet, at full wire speed, on each and every port of the switch.

Finally, the cable television carriers in Canada are still advocating that the "source-based policy routing" of Cisco routers has yet to be tested and that they need to test the Cisco equipment thoroughly before third party access can be made available. However, a number of Layer 3 Ethernet switch manufacturers are saying that their products have been shipped with this feature for quite some time already and that such load testing does not need to be performed on their equipment.

### **TCP/IP emerging as a regulatory middleware for bridging incompatible business models**

The existence of TCP/IP and Internet Protocol layering demands a new understanding by regulators, and everyone else, of what interconnection could mean<sup>12</sup>.

TCP/IP is a phenomenal tool for bridging incompatible business models. We shall look first at the incompatible business models, and then, in a subsequent essay, look at the concept of interconnection in an era of Internet protocols.

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<sup>12</sup> The author will have more to say on this subject in a forthcoming paper to be produced in conjunction with Timothy Denton.

The following table illustrates the fundamental incompatibilities between the business models of Internet services offered by ISPs and Internet access services provided by the cable television carriers.

<b>Internet Service Provider</b>	<b>Cable Television Carrier</b>
<p><b>Horizontally–specialized Internet services provider</b></p> <ul style="list-style-type: none"> <li>• Wants to offer the most specialized Internet Services for a flat fee per month.</li> <li>• Wants to compete with cable carriers to the full extent of what could be achieved if the ISP had complete control over all of the bandwidth available in the cable television network.</li> </ul>	<p><b>Provider of vertically integrated Internet access services</b></p> <ul style="list-style-type: none"> <li>• Wants to remain a traditional cable television carrier and preserve the status quo of non–IP–based television broadcasting.</li> <li>• Wants to offer mass market Internet Services, only as long as such services do not compete with existing television broadcasting activities.</li> <li>• Wants to compete with the incumbent local exchange carriers (ILEC) with lifeline residential telephony services in order to win the business of people who would only want a phone line.</li> </ul>
<p><b>Bandwidth should give birth to new applications</b></p> <ul style="list-style-type: none"> <li>• Generally prefers to throw bandwidth at the problem and maintain a rapid pace of innovation in the introduction of new services rather than sit back, and limiting the number of profitable applications while tightly controlling the bandwidth.</li> </ul>	<p><b>Few regulated services should drive the need for bandwidth</b></p> <ul style="list-style-type: none"> <li>• Allocates bandwidth carefully by confining all Internet Services to as few television channels as possible. Favours implementing IP QoS (Quality of Service) mechanisms for VoIP, rather than simply increasing the bandwidth available to all.</li> </ul>
<p><b>No entrenched business model</b></p> <ul style="list-style-type: none"> <li>• Growing the pie is better than keeping it all for oneself.</li> <li>• To a certain extent, the ISP doesn’t care about the way existing services are being sold today. An IP telephony dialtone doesn’t have to sound like a PSTN dialtone.</li> <li>• Wants its Internet Telephony services to be different from the IP telephony services of the cable television carriers.</li> <li>• Wants its Internet Video Multicasting services to be able to fully compete with the traditional television broadcasting services of the incumbent cable television carrier.</li> <li>• Doesn’t care about centralized control</li> </ul>	<p><b>Entrenched business model</b></p> <ul style="list-style-type: none"> <li>• Bigger priority for going after the market share of the ILEC requires, than growing the overall market.</li> <li>• Risks of failure if the innovation is too strong, therefore offers same services as ILEC, but cheaper.</li> <li>• No will or capability to become a specialized provider, you have to be small for doing this. Total costs of ownership curves generally have an S shape. The cost of the infrastructure far outweighs the ability to remain flexible.</li> <li>• Favours centralized control</li> </ul>

Simple, all-you-can-eat bill	Complex usage-based billing
<ul style="list-style-type: none"> <li>• Favours horizontally-specialized, all you can eat, flat-fee per month, traditional Internet Access business model over a business model of generating revenue streams on a per-application basis.</li> </ul>	<ul style="list-style-type: none"> <li>• Favours TCP/IP applications, which are vertically integrated with their infrastructure in a proprietary manner.</li> <li>• Happy to charge on a per-application basis and firewall certain TCP/IP ports.</li> </ul>

In the era of the Internet, TCP/IP interconnections have the potential to become much more than the regulatory equivalent to traditional facilities-based interconnections.

Without developing a new approach to telecommunications policy which favours horizontal specialization of services rather than the vertical integration of services, the regulators are facing the prospect of seeing Internet services, as we know them today, never materialize in the high-speed Internet access marketplace.

## Conclusion

A few years ago, the cable carriers have been faced with the opportunity to employ ATM technology (IEEE.14) to create a layer 2 network that could provide virtual circuits of fixed capacity over a shared infrastructure. Instead they have chosen DOCSIS and other proprietary standards to limit their exposure to third party access of their plant.

Despite having provided such services in certain instances<sup>13</sup>, cable carriers have been consistently lobbying against the sharing of their plant by way of allocating portions of the coaxial frequency spectrum to third parties. We mean by this the allocation of upstream and 6 megahertz NTSC downstream channels to third parties.

Activities to date on this file in Canada have demonstrated that cable carriers have been capable of fully exploiting their ability to convince regulators that they would be able to meet their common carrier obligations by way of third party access above the physical layer. By this we mean that cable carriers have been able to force usage-sensitive pricing, the use of a specific version of the Internet Protocol, and denied the opportunity of ISPs to access the quality of service mechanisms available in DOCSIS. We now find that the allocation of cable plant spectrum to third parties appears to be the only truly non-discriminatory mean of ensuring non-discriminatory interconnections.

Now that we are being given the chance to look-back at the decisions made to date, we realize that the ability of providing third party access over a shared infrastructure cannot be easily realized by way of higher-layer interconnection policies (i.e. above and without virtual circuits) unless they obey to strict principles by which they can be judged on their merits of meeting equal access and non-discrimination.

The ability of cable carriers to benefit from higher-layer interconnections to facilitate their requirements to meet common-carrier obligations needs to be judged at par with their ability to use such interconnections to limit the ability of Internet Service Providers

<sup>13</sup> [http://www.crtc.gc.ca/ENG/Proc\\_rep/TELECOM/WO\\_NTCE/TARIFFE/ARCHIVE/96octdec/coge1.htm](http://www.crtc.gc.ca/ENG/Proc_rep/TELECOM/WO_NTCE/TARIFFE/ARCHIVE/96octdec/coge1.htm)

to compete. We mean by this that cable carriers in Canada have been given the opportunity to unilaterally decide to impose usage-sensitive pricing, deny ISPs the opportunity to use newer versions of the Internet Protocol and also deny access to quality of service mechanisms available in the DOCSIS standard for no justifiable reason.

End